WATERMELON DISEASES

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FARMERS' BULLETIN 821

UNITED STATES DEPARTMENT OF AGRICULTURE

Contribution from the Bureau of Plant Industry

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Washington, D. C. May, 1917

Additional copies of this bulletin may be obtained free from the Division of Publications, U. S. Department of Agriculture

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1917

IN most of the commercial watermelon-growing districts of the South it is best to select land never previously used for this crop and never exposed to contamination by drainage water, by material from old melon fields introduced in stable manure, or by other means.

Land infested with root-knot should be avoided. Root-knot in the soil can be detected by examining the roots of the preceding crop and of the weeds in the field for galls or enlargements. If these are found, a special rotation of winter grain, velvet beans, corn, and other crops immune to root-knot is advisable.

The blighting of the foliage and the spotting of the melons from anthracnose may be prevented by thorough spraying with Bordeaux mixture during the month preceding the maturity of the crop.

To avoid stem-end rot the most important measure is the disinfection of the cut stems with a bluestone paste when the melons are being loaded into cars. It is helpful also to cut and burn the weeds along fences and ditch banks and to remove and destroy all cull melons.

WATERMELON DISEASES.

CONTENTS.

NEED OF COOPERATION FOR CONTROL OF WATERMELON DISEASES.

THIS bulletin deals primarily with diseases of watermelons as found in the Southeastern States, whence some thousands of carloads are shipped each year to northern markets. The information is, however, applicable to other sections of the country wherever any of the diseases mentioned occur.

The Department of Agriculture is prepared to assist growers in carrying the recommended control measures into effect through its advisory relations with county agents and State extension workers. There is, however, need for a readjustment of marketing conditions and the cooperation of buyers and shippers in securing for the grower a return for his field work in controlling anthracnose and stem-end rot. At present the ownership and responsibility for the melons are shifted when the car is loaded, and growers of infected melons receive the same price as those who spray and treat their fruit. Shippers as well as farmers should understand the relation which field conditions bear to the keeping qualities of watermelons, as described more fully in later pages of this bulletin.

For convenience in reference and identification of the several diseases, the descriptive key given below has been prepared.

DESCRIPTIVE KEY TO WATERMELON DISEASES.

Symptoms.	Disease.
A. The vines wilt suddenly, beginning at the ends of the branches	Wilt.
B. The vines lack vigor and the melons remain small; roots greatly enlarged	Root-knot.
C. The leaves show dark spots and tend to shrivel up. (See also "Malnutrition," p. 17)	Anthracnose.
D. The fruit is spotted with small pits	Anthracnose.
E. The fruit decays at the stem end	Stem-end rot.
F. The fruit decays at the blossom end	Blossom-end rot.
G. The fruit decays where it rests on the ground, with abundant white mold	Ground rot.

WATERMELON WILT.

In most watermelon sections the experience of many years has established the fact that two successive crops of watermelons can not be grown on the same land without risk of failure and that 10 years or more must pass before old melon fields may be replanted. It is more than 20 years since Dr. Erwin F. Smith showed that the cause of these failures is a specific disease, the wilt, and outlined the procedure by which losses may be avoided.

CHARACTERISTICS OF WILT.

The name of the disease indicates its most prominent symptom. Affected vines wilt suddenly and do not recover. Usually one branch after another wilts, beginning at the tip, and dries up until the whole vine is dead. This may occur at almost any time during the growing season, but is most noticeable when the fruit is setting.

Cut the stem, and the woody portion will be found discolored (fig. 1). If a microscope were available, the browned areas, which are the water-carrying vessels, would be seen to be plugged with slender, colorless mold filaments, the watermelon wilt fungus.

CAUSE OF WILT.

The cause of wilt is a fungus[1] which attacks only watermelons. It lives in the soil, enters the small roots, and grows up through the water vessels, which it plugs to such an extent as to cause the vine to wilt. After the death of the vine the fungus grows out to the surface of the ground and there forms multitudes of spores—minute seed bodies—which spread it very widely.

Few soil diseases spread as rapidly as the watermelon wilt or remain longer in infected soil. It is carried by drainage water, on the feet of live stock, in stable manure, and in other ways.

It has a preference for light, sandy soils, and different types of soil vary in their liability to infection and in the period of rotation necessary to free the land of the disease. This is a point to be determined by local experience. Watermelon wilt now occurs from the Atlantic to the Pacific and from the Gulf of Mexico to Iowa and Maryland. It is in sections where it is newly introduced that the directions given in this bulletin will be most helpful if followed, as the older sections have learned them by experience.

CONTROL OF WILT.

The following control measures have all been shown to be of practical importance:

[1] *Fusarium niveum* Erw. Sm.

(1) *Rotation of crops.*—Watermelons must not be planted twice in the same place if wilt prevails. The period which must elapse before the land can be considered free from infection is set by different growers at 10 or 12 years, or longer. This, of course, does not apply to those sections where wilt does not occur and where short-term rotations may be followed.

(2) *Control of drainage water.*—Land which has received drainage or flood water from a melon field may be considered infected. In selecting land for melons, plant the lower fields first and the hilltops last.

(3) *Avoidance of stable manure.*—The wilt fungus grows well in stable manure, and a field to which infected manure or compost is applied is almost invariably a failure. Most stables become infected from portions of melon vines brought in with hay cut from melon fields after the crop is off and remain so infected from year to year, indefinitely. Consequently in districts where wilt prevails it is advisable to use only commercial fertilizer for watermelons.

(4) *Control of live stock.*—The wilt is spread also by cattle and horses which range from an old melon field to other fields which may be planted to melons later. Scattered cases of wilt traceable to this cause have been observed to be most frequent along the paths to water and near trees where the animals congregate.

(5) *Resistant varieties.*—None of the standard varieties of melons is materially resistant to wilt. A wilt-resistant variety, named Conqueror, has been bred by the Department of Agriculture by crossing the Eden with the stock melon or citron (fig. 2), and a similar line of breeding, continued by the North Carolina Agricultural Experiment Station, has also resulted in the production of a resistant melon. Neither of these varieties is recommended for general use at present. The Conqueror is an oval, striped melon, a type not popular in the markets, and while of good quality when grown in the sand hills of South Carolina, where it was originated, it has shown a tendency to vary from type in some cases when grown elsewhere.

FIG. 1.—Watermelon wilt. Cross and longitudinal sections of the stem of a diseased plant, showing the blackening of the wood characteristic of the disease.

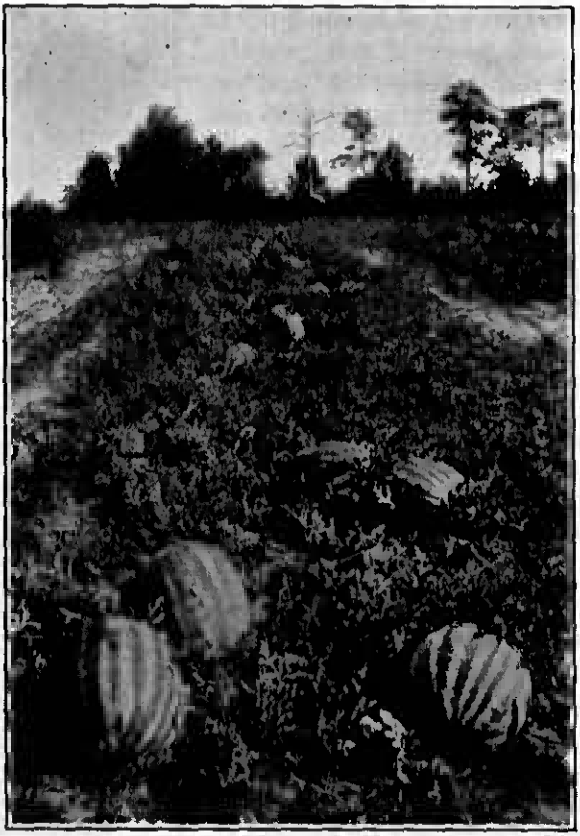

FIG. 2.—Resistant watermelons. A field of Conqueror melons free from wilt on a badly infected field where all other varieties failed.

Thus far, also, enough new land has been available to furnish an ample acreage for melons. Ultimately it would seem that a resistant variety will be needed, and it is felt that the way has been found to produce one.

ROOT-KNOT.

The watermelon is very susceptible to injury by the root-knot nematode,[1] a pest very widely distributed in the South on most vegetables, cotton, cowpeas, etc., and some losses to melon growers have occurred.

The aboveground effect of root-knot is mainly a stunting or reduction in vigor of vine and size of fruit. The roots are the seat of the injury and these are greatly swollen, distorted, and knotted. (Fig. 3.)

Root-knot is a pest of old fields, and the practice of growing melons on new land fortunately avoids much loss. Growers, however, should bear in mind the susceptibility of this crop to root-knot whenever considering the planting of old fields.

Root-knot can be controlled in a practical way only by a system of rotation with nonsusceptible crops, such as winter grains, corn, velvet beans, and Iron or other resistant cowpeas. For a full discussion of this important matter, consult Farmers' Bulletin 648, "The Control of Root-Knot," which will be sent free upon application to the Department of Agriculture.

ANTHRACNOSE.

One of the most troublesome watermelon diseases is anthracnose. This affects the leaves and vines as well as the fruit. Irregular, dark,

[1] *Heterodera radicicola* (Greef) Müller.

dead spots appear on the leaves, which dry up and die prematurely. The stems may be spotted in a similar way.

The melons may develop spots, at first water-soaked and later sunken and covered with a pink growth of spores. (Fig. 4.) Hundreds of these spots of varying sizes may appear on a single fruit. At first shallow, they may become deeper and result in the decay of the flesh when followed by other fungi. In any case the melons are disfigured and their market value much lessened.

FIG. 3.—Root-knot. Melon root, showing galls caused by nematodes.

CAUSE OF ANTHRACNOSE.

Anthracnose is due to a fungus[1] widely prevalent not only on watermelons but also on cucumbers, cantaloupes, and other plants of the cucurbit family. Closely related but different fungi cause the anthracnose of cotton, bean, and sugar cane, citrus wither-tip, and similar diseases of many other crops.

The fungus, which is itself a plant, penetrates the watermelon and develops there in the form of minute moldlike threads. It is spread widely and rapidly by its tiny seed bodies, or spores, produced in uncountable numbers on the spotted leaves and fruit. Without moisture these spores can not germinate or infect the plant; hence, anthracnose may not appear at all during dry weather, but it develops very rapidly during periods of rain or heavy dews, particularly if the weather is warm. The anthracnose fungus has a peculiar ability to remain dormant in the melon rind and develop into visible spots later when heat and moisture conditions are favorable; consequently, the disease often appears almost overnight on whole carloads en route to market if the weather is warm and muggy. The original infection, however, is to be traced back to the field, where the foliage was blighted.

The premature death of the leaves has other unfavorable consequences in that the melons can not ripen normally and their flavor is inferior. The fruit is also no longer shaded from the sun and tends to sunburn.

[1] *Colletotrichum lagenarium* (Pass.) Ell. and Halst.

CONTROL OF ANTHRACNOSE BY SPRAYING.

Anthracnose can be prevented by spraying with Bordeaux mixture if it is done thoroughly and at the proper times. In seasons when the disease is severe two or three applications will save the crop, of which half or more might otherwise be lost. The accompanying illustrations (figs. 5 and 6) show the results of such spraying with only two applications.

Inasmuch as some trials of spraying have failed to give satisfactory results, the attention of growers is directed to some essential details the neglect of which was responsible for all failures investigated.

Dates and number of applications.—The weather is the deciding factor. It has been pointed out that the disease can not spread without moisture and that its severity is proportional to the number of rainy days during the period when the melons are ripening. Since it is desirable to avoid the expense of unnecessary sprayings, the weather and the fields should be watched closely. If a drought prevails during the early growing season, spraying may be postponed until two weeks before ripening time, when a thorough spraying should be given. If evidences of the disease on the leaves are detected earlier, spraying should begin sooner. Second and third

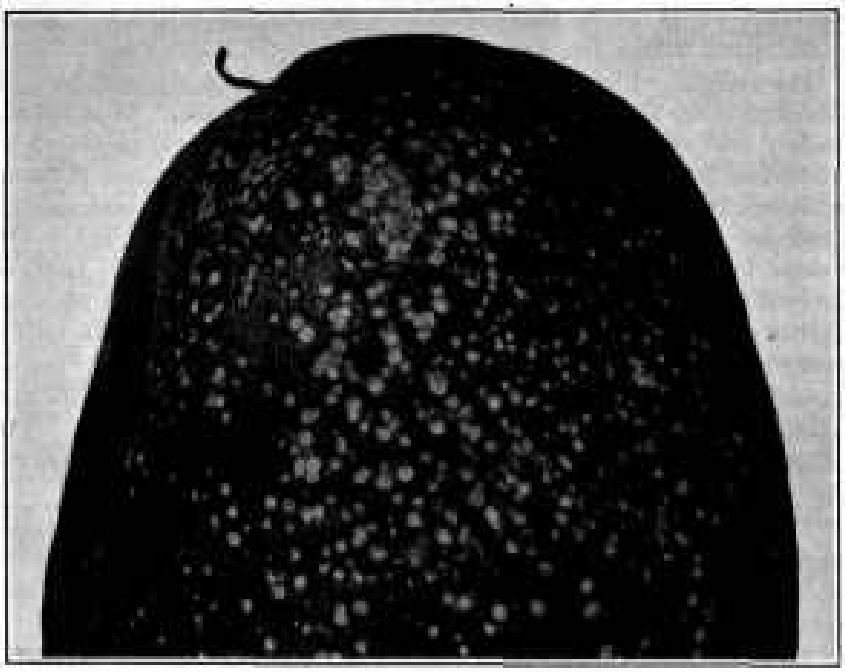

FIG. 4.—Anthracnose. Portion of a watermelon showing the small, depressed spots characteristic of this disease.

FIG. 5.—Part of an unsprayed watermelon field, showing the foliage killed by anthracnose.

applications should be given at intervals of 5 to 10 days, depending upon the rainfall. The more rain, the more one must spray. It is better to spray in advance of a rain rather than after it, provided there will be time for the Bordeaux mixture to dry on the leaves. Once dry it is not easily washed off.

Methods and apparatus.—For large melon fields under southern conditions a power sprayer similar to those used for orchards is most effective. No material change in equipment will be needed, unless it may be to provide longer lines of hose, so as to reach 25 to 30 feet on each side of the sprayer. Keep open throughout the season, at intervals of 50 to 70 feet, such roadways as will be needed later for hauling out the melons.

Spray under high pressure—140 to 200 pounds. Spray thoroughly, covering as much of the under sides of the leaves as is practicable. Provide loading stations with elevated platforms for refilling the sprayer with Bordeaux mixture and use stock solutions when possible, as this saves time and reduces expense.

How to make homemade Bordeaux mixture.—The several ingredients should be used in the following proportions:

Copper sulphate	4 pounds.
Quicklime	4 pounds.
Water to make	50 gallons.

Prepare the copper sulphate by suspending it in a gunny sack just below the surface of several gallons of water in a clean barrel. When the sulphate is dissolved, which requires three or four hours, remove

FIG. 6.—Anthracnose control by spraying. A hill adjacent to the field a part of which is shown in figure 5, but which had been protected by two sprayings with Bordeaux mixture.

the sack and stir into the barrel enough additional water to make exactly 25 gallons of the copper solution.

Prepare the lime by slaking it slowly and thoroughly in a clean barrel, strain, and add enough water to make exactly 25 gallons of lime milk. Stir thoroughly.

Pour the two ingredients together into another barrel, or, better, directly into the spray tank if it will hold 50 gallons. It is highly important to stir the mixture very thoroughly and to strain both ingredients before they are combined, as otherwise the clogging of the spray nozzles may result. Use a copper or bronze wire strainer of 18 meshes to the inch. Do not put copper sulphate or Bordeaux mixture into tin or iron vessels; use wood or copper containers. Prepare the Bordeaux mixture as needed and apply at once. It is never so good after it has settled.

Stock solutions.—Everyone who uses Bordeaux mixture frequently and in quantity will find it convenient to keep concentrated stock solutions on hand, as these keep indefinitely if the water which evaporates is replaced.

Build an elevated platform to hold the barrels. Suspend 50 pounds of copper sulphate to dissolve in a 50-gallon barrel of water. Slake 50 pounds of lime in another barrel. Add water to make 50 gallons of lime milk. When Bordeaux mixture is needed, stir both stock barrels and take from each as many gallons as the formula calls for in pounds. Dilute the copper sulphate in one barrel and the lime

milk in another, each with half the water, and let the two run together into the strainer of the spray tank.

To those who expect to spray on a large scale, more detailed instructions about fungicides and their application than can be given here are available in Farmers' Bulletin 243 of the United States Department of Agriculture, "Fungicides and Their Use in Preventing Diseases of Fruits."

Cost of spraying.—The cost of spraying depends upon factors which vary according to locality and season, including the number of applications needed, the wages and efficiency of the labor, and the cost of materials. The copper sulphate should be bought in wholesale quantities. One hundred gallons of Bordeaux mixture per acre are required for thorough spraying, and 12 to 20 acres per day can be covered with one power outfit.

STEM-END ROT.[1]

A rapid decay, usually beginning at the stem end and developing during transit to market, has caused losses during recent years that for some sections have been perhaps more serious than any other melon disease. Many cars have reached their destination with 75 to 95 per cent of their contents spoiled. On one day in 1915 in 100 cars on the tracks in a large northern market an average of 25 per cent of the melons was decayed with stem-end rot. So accustomed have the melon handlers become to this disease that it is a common practice when unloading to test every melon as it is passed out of the car by exerting pressure with the thumb at the stem end. If the rind gives way, the melon is rejected.

The first indication of the trouble is a browning and shriveling of the stem. Decay of the melon begins at the point of attachment to the stem, where the flesh softens and takes on a water-soaked appearance. An illustration of such a diseased watermelon is shown on the title-page. A band of decay progresses down the fruit at the rate of half an inch to 1½ inches a day and under moist conditions soon becomes covered with a dark-gray mold. (Fig. 7.) The flesh of the melon becomes soft and slimy.

The same type of decay may begin at a point on the side of the melon where there is a wound or bruise, and it is very common in the fields as a blossom-end rot. These melons, if left in the field, become wrinkled, black mummies, and are dangerous centers of infection. (Fig. 8.)

CAUSE OF STEM-END ROT.

Stem-end rot is due to a fungus[2] closely related to or identical with species which cause a stem-end rot of citrus fruits, a decay of

[1] This section is based on the work of Mr. F. C. Meier, student assistant.
[2] *Diplodia* sp.

sweet potatoes, a cotton boll-rot, and other plant diseases. They are all alike in being wound or weakling parasites, that is, they will not attack a living plant or fruit unless it is weakened or dying from some other cause or has been cut or bruised.

The stem-end rot fungus is common on ripe or dying vegetation in and around the melon fields, especially on cotton and corn stalks, coffee weed, and old melon vines. These plants become covered with the black fruiting bodies of the fungus (fig. 9), in which countless spores are borne and from which they are scattered by the wind. In this manner the fungus lives over winter and is carried in the spring to infect the blossom ends of imperfect melons or the cut stems of culls. Such melons, decaying in the field, are the chief sources of

FIG. 7.—Part of a watermelon with stem-end rot.

FIG. 8.—Watermelon stem-end rot. Decaying and mummifying culls in the field. These are a source of infection to the remainder of the crop.

infection, as they become literally masses of spores. Figure 10 shows these spores magnified 360 times and illustrates their germination and the beginning of the mold thread which infects the melon.

INFECTION AND DEVELOPMENT.

When a melon is cut from the vine, a drop of sap exudes from the cut stem and provides ideal conditions for the germination and development of the fungus. Since the spores are wind borne, they are abundant in the air and are likely to find lodgment on the cut stems. The knives and hands also are carriers of infection, as the workmen are likely to handle or cut into decaying melons. Within 24 hours the blackening of the cut surface may be perceived, and by about the third day the fungus has grown down the stem into the melon and started a rot.

That sound and healthy melons from well-cultivated fields may be thus ruined within three to five days is difficult for many to believe until they have seen it, but numerous experiments have proved beyond a doubt the nature of the disease and have disproved several ideas that have been advanced concerning it.

RELATION TO FERTILIZERS.

Stem-end rot is not due, as many think, to the use of large quantities of fertilizers or to the excessive use of nitrates or any particular ingredient. Growers may safely continue to fertilize their watermelon fields in the manner that experience has shown to produce the earliest and the largest crops.

RELATION TO VARIETIES.

All varieties of watermelons tested have proved to be subject to stem-end rot. There is no reliable evidence to indicate that the varieties now in cultivation have deteriorated or that those formerly grown were less liable to this disease. The breeding of resistant varieties is not one of the measures indicated for its control.

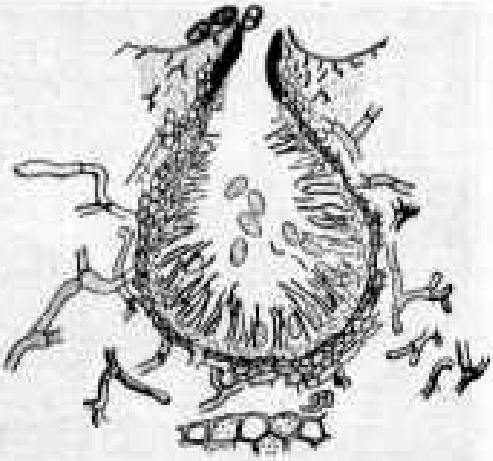

FIG. 9.—Watermelon stem-end rot fungus. Section through a spore case (pycnidium), showing the production of spores. (Greatly magnified.)

RELATION TO MATURITY.

Watermelon fruits are subject to stem-end rot at all stages of development. Green fruits, if infected, will decay as quickly as ripe fruit. The shipping of immature melons, therefore, will not avoid stem-end rot.

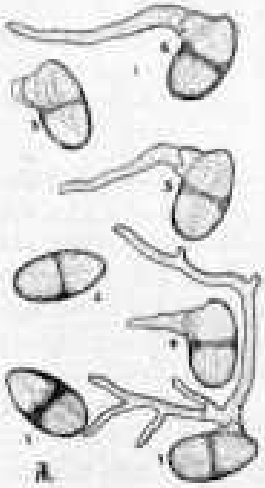

FIG. 10.—Spores of the fungus causing watermelon stem-end rot. Spores taken from a freight car which had contained decayed melons are shown at 1, 2, and 3. Six months later 5 per cent of them were alive and germinated when moistened, as shown at 4, 5, 6, and 7. ×360.

RELATION TO CHEMICAL INJURY.

Before the nature of stem-end rot was understood, the losses were charged to the presence of lime, salt, and fertilizer residues on the walls of cars. Extended experiments have now shown that injuries from such substances are not common and that the effect produced by chemicals can be distinguished readily. It is confined, in the first place, to melons that have been in contact with car walls or floors, and, in the second place, to the sides of the melons which are abraded; or, in cases where the fertilizer residues were wet, there may be shallow, brown depressions in the rind, which do not decay until fungi have gained entrance.

Chemical injury (fig. 11) has been found to cause a very small fraction of the losses among watermelons at terminal markets. It can be avoided by cleaning the cars thoroughly before loading them with melons and by the use of a strong paper for lining.

CONTROL MEASURES.

The prevention of stem-end rot is to be accomplished by keeping the spores of the causal fungus from entering the cut stem. Two lines of action are advisable: (1) Field sanitation, to reduce the danger of infection, and (2) stem-end treatment with a disinfectant.

Clean up the fields.—It has been shown that dead vegetation of nearly all kinds is likely to harbor the stem-end rot fungus. The first step, therefore, is to clear and burn the weeds and rubbish in the fence rows and along ditch banks. This should be done in the winter. Deep plowing, to turn all the vegetation in the field so far under the ground that it will not be exposed by next season's cultivation, also should be helpful. Both these measures are in any case demanded by good farm practice, particularly in the boll-weevil districts.

Gather and destroy all cull melons.—During the growing period the fields should be gone over once a week and all imperfect or cull melons, blossom-end rots, etc., carried out, because if left to decay in the field they will infect the crop. Probably the most practicable method of disposing of these culls is to feed them to hogs, since stable manure should not be used on melon fields in any case on account of wilt. The carts used for hauling should be washed subsequently with a 2 per cent solution of bluestone.

Spray for anthracnose.—The methods advised for anthracnose control on page 8 will be helpful against stem-end rot, as the fungus which causes the latter disease does not attack a healthy melon vine, but will grow on leaves and stems killed by anthracnose and thence be carried to the melons.

Harvesting methods.—The cutters must never touch or cut into a decayed melon. Knives may be disinfected in a 2 per cent formalde-

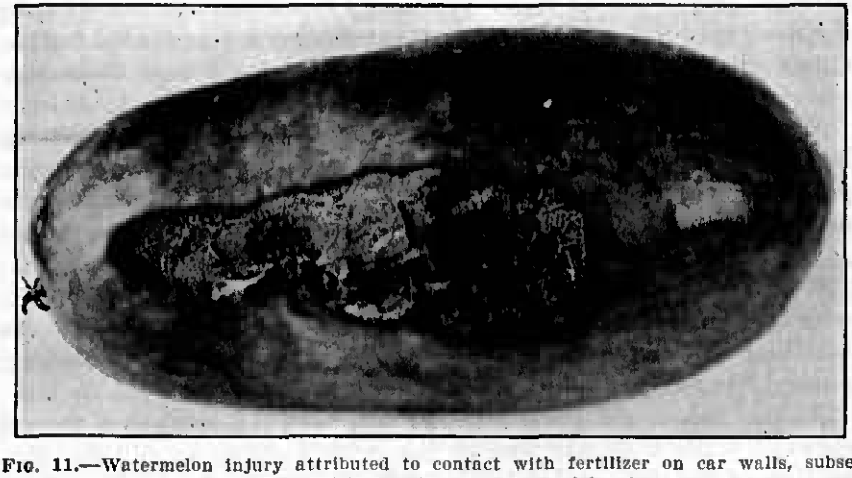

FIG. 11.—Watermelon injury attributed to contact with fertilizer on car walls, subsequent bruising, and the entrance of fungi.

hyde solution. Have the melons cut with the longest possible stems, as it takes longer for the fungus to grow up a long stem and it makes the second cutting at the car easier. Haul the melons to the car without delay. Fruits left in the fields until the next day may become infected in spite of the treatment. Handle carefully to avoid breaking or splitting the stem and to avoid bruises. Open the car ventilators, as this tends to better keeping. See that the bedding is dry, as melons loaded on wet bedding are more liable to decay.

Stem treatment at the car.—Since it is unlikely that all infection can be prevented by field sanitation, the most important control measure is the disinfection of the stem at the time of loading the car, using a paste that will adhere and for the quantity used be nonpoisonous and practically invisible. Such a material is starch paste with bluestone. It may be prepared in 1-gallon lots as follows, using a kettle of sufficient size of enamel ware, as the bluestone attacks iron or tin: Place 3½ quarts of water and 8 ounces of bluestone in the kettle and bring the mixture to a boil over a good fire. While it is heating, mix 4 ounces of starch with 1 pint of cold water, stirring until a milky solution free from lumps is obtained. As soon as the bluestone is entirely dissolved and the solution boiling, add the starch mixture, pouring it in a slow stream and stirring the hot solution vigorously to prevent the formation of lumps. Continue boiling and stirring the mixture until the starch thickens evenly. It may be tested at intervals by allowing it to run from the end of the paddle. This should not require more than one or two minutes' boiling after the addition of the starch.

The paste seems to be more readily applied when made up fresh, but if it is desired to make up a quantity at one time it may be depended upon to keep a week or two by using only one-fourth to one-half the proportion of water previously specified and then diluting the resultant thicker paste to the proper consistency as needed for use. Quart glass fruit jars with glass or enamel lined tops make convenient containers.

Where conditions require the use of a disinfectant paste made up in advance or bought in the market, a neutral commercial Bordeaux paste will be effective and convenient, as these are purchasable in small containers. Thin with water to the consistency of paint and apply with a brush in the same manner as the starch paste.

It is recommended that this be applied at the car, for experiments with stem treatment in the field were less effective because the handling rubbed off the paste or split the stem. The following method has proved to be practical and effective.

As the melons are packed in the car, have the stem ends turned outward while a second man or boy with a sharp knife cuts off a portion of the stem and applies a dab of paste to the fresh surface.

One man can accomplish this treatment without interfering with the speed of loading and can keep up with two packers. A quart of paste, costing only a few cents, will be needed for each car. To this expense must be added the labor cost of one boy or man for the number of hours required to load the car.

Car disinfection.—When freight cars have contained decayed melons or yard refuse they should be cleaned and disinfected before reloading with melons. For this purpose a 2 per cent solution of bluestone, applied with a spray pump to the interior walls, ceiling, and floor, will be found satisfactory. Five gallons will be required and the time of two men for 20 minutes.

MINOR DISEASES.

The wilt, root-knot, anthracnose, and stem-end rot already described are the only diseases which influence in a large way the culture of watermelons. Some other troubles, however, are met with occasionally, and these may be mentioned briefly.

Stem blight,[1] a fungous disease, produces an effect somewhat resembling wilt, but the vines tend to die from the center outward and diseased areas are visible on the stems, often with a gummy reddish exudate. Pull and burn diseased vines.

Bacterial wilt,[2] a serious trouble of cucumbers, occasionally attacks watermelons. The great majority of cases of wilt in watermelons, however, are of the Fusarium type described on page 4. The outward effects of the two diseases are much alike, but if one cuts the freshly wilted stem and on touching the finger to the exudate finds that it can be drawn out into fine mucilaginous strands, it may be concluded that bacterial wilt is present. Advice concerning remedial measures for bacterial wilt will be supplied by the Department of Agriculture upon application.

Downy mildew,[3] a leaf disease producing an effect similar to anthracnose, sometimes occurs, though it is more especially a cucumber trouble. Downy mildew does not attack the fruit. It is controlled by the spraying measures advised for anthracnose.

Malnutrition produces a leaf spotting distinguishable from anthracnose in that the spots are lighter brown and are located around the leaf margins and between the veins. This trouble is attributed to a lack of potash, but has not been sufficiently studied on watermelons to justify recommendations for preventing it during the present period of potash shortage.

Blossom-end rot is very common in most fields, but has been little studied. It seems to begin with an imperfect fruit, possibly

[1] *Mycosphaerella citrullina* (Sm.) Gr. [3] *Peronoplasmopara cubensis* (B. and C.) Clint.
[2] *Bacillus trachciphilus* Erw. Sm.

due to defective pollination. Such culls are later invaded by decay-producing fungi. The Diplodia of stem-end rot is perhaps the most common, but other fungi also occur. Control measures consist in the prompt destruction of culls, to get rid of infection.

Ground rot, so called because it begins on the side of the melon next to the soil, is due to a fungus very common in the South,[1] which is characterized by an abundant growth of white mold and the formation of numerous roundish, brown bodies the size of buckshot. This decay begins in some crack or in insect injury. The only control measure to be taken is the destruction of the affected fruits. A large number of other vegetables and cultivated plants are attacked by this parasite.

SUMMARY OF CONTROL MEASURES.

Loss from *wilt* is avoided by planting on land not previously used for watermelons, with precautions against the use of infected stable manure and spread by drainage water and live stock.

Losses from *root-knot* can be prevented by the use of land free from infestation by this pest.

Anthracnose is controlled by thorough spraying with Bordeaux mixture during the month preceding the maturity of the crop.

For *stem-end rot* the most important measure is the disinfection of the cut stems as the melons are being loaded into cars.

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[1] *Sclerotium rolfsii* Sacc.